TR77400
ECS SS12946

SPACE SHUTTLE PROGRAM
Space Shuttle Projects Office (MSFC)
NASA Marshall Space Flight Center, Huntsville, Alabama

Reusable Solid Rocket Motor

STS-113 Flight Readiness Review/CoFR

Motor Set RSRM-86

31 October 2002

Presented by Terry Boardman

ATK THIOKOL PROPULSION

P.O. Box 707, Brigham City, UT 84302-0707 (435) 863-3511

Agenda

Flight Readiness Review/CoFR

1.0 Previous Flight Assessment—STS-112

2.0 Certification Status—**No Constraints**

3.0 Changes Since Previous Flight—**None**

4.0 Configuration Inspection

- 4.1 As-Built Versus As-Designed, Hardware, and Closeout Photo Review Status—**No Issues**
- 4.2 Hardware Changeouts Since ET/SRB Mate Review—**None**

5.0 SMRB Nonconformances—**None**

6.0 Technical Issues/Special Topics

7.0 Readiness Assessment

Backup LCC and Contingency Temperatures for STS-113

Previous Flight Assessment—STS-112

Disassembly Evaluation Summary—Status of Disassembly Activity

KSC Operations		LH RSRM	RH RSRM	Remarks
Initial LH/RH SRB viewing	*	Complete	Complete	
SRB/RSRM walkaround assessment	*	Complete	Complete	
Demate/evaluate aft exit cone (AEC)	*	Complete	Complete	
Remove/evaluate S&A and OPTs	*	Complete	Complete	
Remove/evaluate nozzle	*	Complete	Complete	
Remove/evaluate stiffener rings/stubs		Complete	Complete	
Remove/evaluate igniter	*	Complete	Complete	
Demate/evaluate field joints/evaluate insulation	*	Complete	Complete	
Utah Operations				
Disassemble/evaluate nozzle (joint No. 4 and 5)	*	Complete	Complete	
Disassemble/evaluate nozzle (joint No. 2 and 3)	*	Complete	Complete	
Disassemble/evaluate S&A	*	Complete	Complete	
Washout nozzle phenolics		10 Jan 2003	10 Jan 2003	
Washout nozzle AEC phenolics		10 Jan 2003	10 Jan 2003	
Measure/evaluate aft dome insulation		28 Feb 2003	28 Feb 2003	
Measure/evaluate RH segment and igniter insulation		N/A	28 Feb 2003	

* RSRM Project committed to complete prior to next launch

- **No constraints to STS-113 flight**

Technical Issues/Special Topics

Special Topic—Missing Nozzle Nose Cap Radial X-ray Film

Observation

- During a 100-percent audit of STS-113 x-ray inspection film, it was noted that all RH nozzle nose cap phenolic component radial shots were missing

Concern

- Evaluation of nose cap phenolic for critical flaws

Discussion

- Inspection of a nozzle nose cap includes a minimum of 720 tangent films and 66 radial films—all 720 STS-113 nose cap tangential shots accounted for and reevaluated with no defects noted
    - Tangent film shots provide 100-percent coverage of nose cap phenolic material for defects
- Immediate corrective action in place to assure all film is taken and read—long-term plan addresses x-ray planning and accounting systemic weaknesses

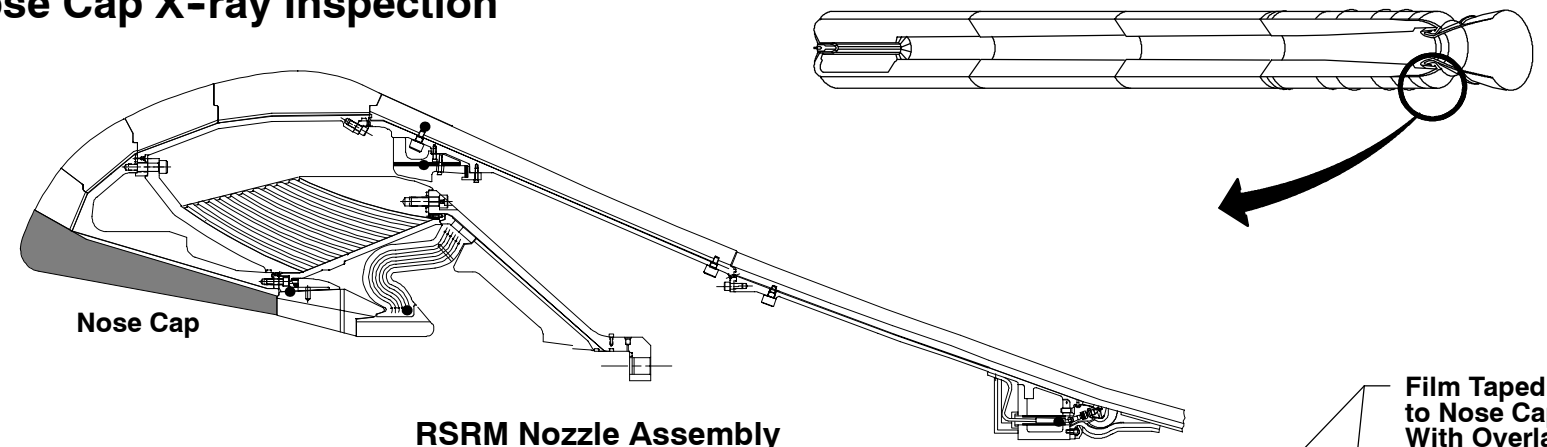
Flight Rationale

- Tangential film fully screens for critical nose cap defects—none noted
- STS-113 is safe to fly

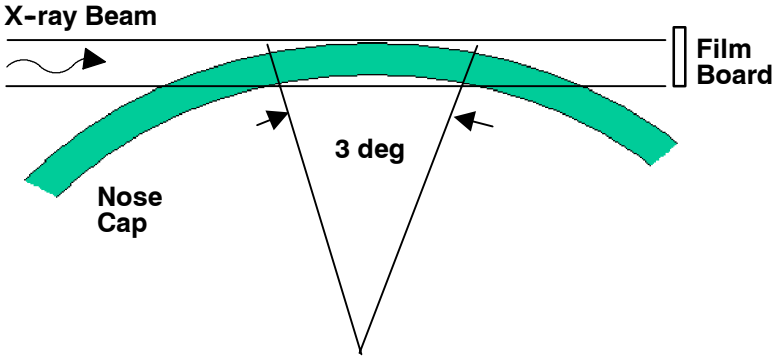
Technical Issues/Special Topics

Special Topic—Missing Nozzle Nose Cap Radial X-ray Film (Cont)

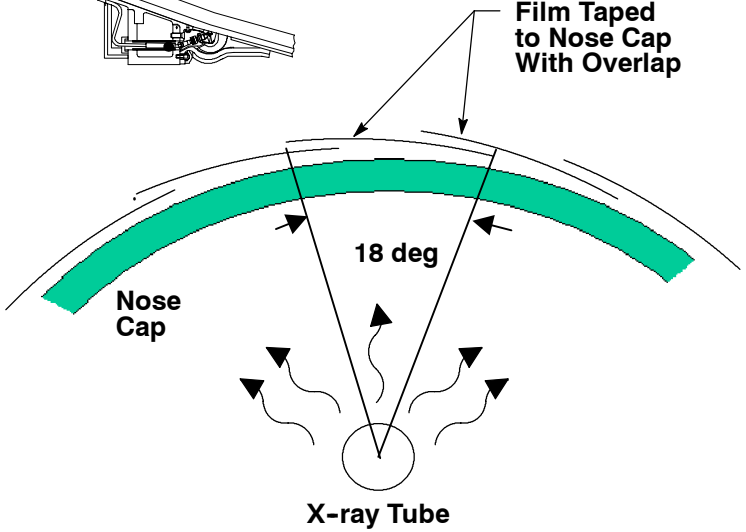
Nose Cap X-ray Inspection



RSRM Nozzle Assembly



Tangential X-ray
(2 films at each of three axial stations every 3 deg; 720 total films)



Radial X-ray
(22 films at each of three axial locations; 66 total films)

ATK THIOKOL PROPULSION

STS–113 Readiness Assessment

Pending satisfactory completion of normal operations flow (per OMRSD), the RSRM hardware is ready to support flight for mission

STS–113

31 October 2002

/s/ T. A. Boardman

T. A. Boardman
RSRM Deputy & Chief Engineer
Thiokol

/s/ R. K. Burt

R. K. Burt
Chief Engineer, RSRM Project
NASA, MSFC

/s/ H. L. Reed

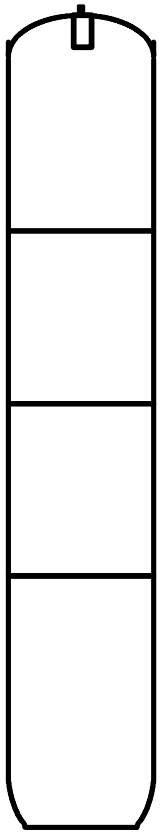
H. L. Reed
Director
RSRM Operations & Flight Support
Thiokol

/s/ M. U. Rudolphi

M. U. Rudolphi
Manager
RSRM Project Office
NASA, MSFC

Current Flight Predictions

LCC and Contingency Temperatures for STS-113



Heater Location	LCC	Minimum Allowable Sensor Temperature*	
		LH	RH
Igniter	74°F	72°F	72°F
Forward Field Joint	86°F	71°F	65°F
Center Field Joint	86°F	72°F	68°F
Aft Field Joint	86°F	73°F	68°F
Nozzle-to-Case Joint	75°F	63°F	63°F

*LCC contingency temperature in the event of heater failure
Note: Calculation includes all standard repair conditions